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The Utilization of Recycled Construction and Demolition Waste Aggregate in Asphaltic Concrete

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Abstract : Utilizing construction and demolition wastes in hotmix asphalt (HMA) pavement construction can reduce the adverse environmental effect of its inadequate disposal and reduce the pressure of extracting and processing mineral aggregates (MA). This study aims to examine the viability of replacing MA by recycled construction and demolition waste aggregates (RCDWA) in the wearing course of asphaltic concrete (AC) pavements without compromising its loadbearing capacity. The Marshall Method was used to evaluate the performance of AC wearing course specimens by replacing MA by 10%, 20% and 30% RCDWA. Grade 60/70 bitumen was used in the range 3.0-5.5%, with 05% increments, to generate the optimum bitumen content (OBC). From the volumetric analysis and test property curves, the mixture containing 20% RCDWA was chosen as the preferred mix at 5.1% OBC. It possessed a 10% increase in Marshall Stability compared to the reference specimen, containing 100% MA, and a 6% increase in Marshall flow.

Keywords : aggregate, asphaltic concrete, Marshall method, optimum bitumen content, recycled construction and demolition waste
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